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REMARKS

The Examiner is thanked for the careful examination of the application, and for the indication of allowable subject matter. However, in view of the foregoing amendments and the remarks that follow, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejections.

Claims 1, 4-5, 8-9, 11, 14-15, 17, and 20-23 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,433,787, hereinafter *Suzuki*, in view of U.S. Patent No. 6,086,677, hereinafter *Umotoy et al.*

Claims 1 and 9 define a thin film deposition apparatus which includes a vacuum reaction chamber and a dividing plate, wherein the vacuum reaction chamber is divided or separated by the dividing plate into a plasma discharge space and a film deposition space. Claim 1 recites that the dividing plate is made of a plurality of laminated plates connected together by securely bonding them over substantially an entire area of their interfacial surfaces. Claim 9 recites that the plurality of plates are bonded together over a sufficiently large portion of the interfacial surfaces so as to prevent radicals passing through the plurality of holes therein from passing between any of the plurality of plates into any of the internal spaces. Claim 15 defines a dividing plate for a thin film deposition chamber, wherein the chamber has a vacuum reaction chamber that includes a plasma discharge space and a film deposition space. Claim 15 defines the dividing plate as including a plurality of plates that are bonded together over a sufficiently large portion of the interfacial surfaces so as to prevent radicals passing through the plurality of holes therein from passing between any of the plurality of plates into any of the internal spaces. And,

claim 21 defines a thin film deposition apparatus including dividing means which includes a plurality of plates bonded together over a sufficiently large portion of the interfacial surfaces so as to prevent radicals passing through the communicating means from passing between any of the plurality of plates into any of the internal spaces.

The remaining claims are dependent claims that depend from the aforementioned independent claims.

The Examiner alleges that *Suzuki* discloses all of the elements of the rejected claims except it does not teach that the plurality of laminated plates are connected together by securely bonding them over substantially an entire area of the interfacial area. Applicants reserve the right to challenge this determination at a later time, if necessary and appropriate.

To overcome the acknowledged deficiency of *Suzuki*, the Examiner relies on *Umotoy*. The Examiner alleges that *Umotoy* teaches fusing together a plurality of laminated plates at their contacting surfaces for the purpose of avoiding the use of O rings while maintaining separation of gases as gases transition from the upper plate to the lower plate. The Examiner then concludes that "...it would have been obvious to one of ordinary skill in the art at the time [of] the Applicant's invention was made to have provided a plurality of laminated plates fused together at their contacting surfaces in order to avoid the use of o- rings while maintaining a separation of gases as the gases transition form an upper plate to a lower plate as taught by *Umotoy et al.*"

However, it is important to note that the Examiner's explanation does not allege that there is any motivation or suggestion in the art to modify the teachings of *Suzuki* with

the teachings of *Umotoy*. As such, the rejection is improper in that the Examiner has not alleged any motivation *to modify Suzuki*. Applicants further submit that one of ordinary skill in the art would *not* have been motivated to modify the teachings of *Suzuki* with the teachings of *Umotoy*.

Specifically, *Suzuki* discloses a special type of apparatus for forming deposited film which utilizes light to accelerate the film forming process. See column 1, lines 51 - 53. To accomplish this, *Suzuki* uses a light-transmissive diffusion plate 12, 15, preferably made of fused quartz (column 7, lines 22 - 27, and column 9, lines 43 - 45). In other words, an important aspect of *Suzuki* is that the diffusion plate 12, 15 is made of a light-transmissive material. It is an object of *Suzuki* to enable light to transfer *through the dividing plate* to the substrate in the reaction chamber.

On the other hand, *Umotoy* discloses a semiconductor wafer processing system that includes a showerhead 114 having a face plate 130 that is made of metal. See column 5, lines 14 - 15. *Umotoy* teaches that the upper and lower gas distribution plates 148, 150 in the face plate 130 are secured to each other by fusing the aluminum plates to each other to form a unitary faceplate. See column 5, lines 5 - 9; column 6, lines 26 - 31; and column 3, lines 33 - 44.

Clearly, the aluminum fusing process of *Umotoy* could not be applied to the quartz or light transmissive plates 12, 15 of *Suzuki*. Specifically, the quartz plates in *Suzuki* cannot be bonded with an aluminum fusing process. And, more importantly, one of ordinary skill in the art would not be motivated to look to the technology of *Umotoy*, which uses aluminum plates, to modify the technology of *Suzuki*, which uses quartz plates.

In addition, using the *Umotoy* technology with the *Suzuki* plates would not have worked. Specifically, the plate fusing technology disclosed by *Umotoy* could not be utilized in the *Suzuki* dividing plate 12, 15.

Accordingly, the combination of *Suzuki* and *Umotoy* is improper and should be withdrawn.

Furthermore, independent claims 9, 15, and 21 have been amended to indicate that the dividing plate is made of an electrically conductive material. Support for these amendments can be found in the figures, which illustrate the cross-sectional views as cross-hatched for metal. Furthermore, paragraph [0057] of the application discloses that the dividing plate 124 is held at ground potential. For the dividing plate to be held at ground potential, it must be made of an electrically conductive material.

The electrically conductive dividing plate is substantively different from the quartz plate of *Suzuki*. Specifically, the electrically conductive dividing plate will prevent the electric field in the plasma generating space from penetrating into the internal spaces of the dividing plate, so as to prevent the decomposition and/or deterioration of the material gas in the internal spaces of the dividing plate.

Accordingly, in view of the fact that the combination of *Suzuki* and *Umotoy* is improper, and further in view of the fact that claims 9, 15, and 21 have been amended to clarify that the dividing plate is electrically conductive, the rejection of claims 1, 9, 15. 21 must be withdrawn.

In view of the fact that the remaining claims of the rejection depend from claims 1, 9, 15, and 21, the rejection of the dependent claims in the present application should also be withdrawn.

With respect to claims 5 and 8, the Examiner recognizes that the prior art does not teach the subject matter of those claims. The Examiner alleges that *Umotoy* teaches that hole size is merely a process condition and that it would have been obvious to find an optimum gas hole configuration. However, the elements of claims 5 and 8 result in a beneficial result, i.e., preventing the precursor gas from flowing back toward the plasma discharge space. See paragraph 0045 of the present specification. Accordingly, the elements of claims 5 and 8 are more than simply "optimization".

Claims 10 and 16 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Suzuki* and *Umotoy* in view of U.S. Patent No. 5,433,786, hereinafter *Hu*. The Examiner concedes that *Suzuki* and *Umotoy* do not teach the use of rivets to bond together the plates in the dividing plate. The Examiner alleges that *Hu* teaches the use of rivets to assemble an *electrode*. However, claims 10 and 16 relate to bonding a plurality of plates in a dividing plate, not an electrode. Accordingly, applicants submit that one of ordinary skill in the art would not have been motivated to apply the teachings of *Hu* to those of *Suzuki* and *Umotoy*.

Accordingly, the rejection of claims 10 and 16 is improper for the reasons set forth above in the preceding paragraph and for the reasons set forth above with respect to claims 9 and 15.

In addition, to further define the protection to which Applicants are entitled, new claims 24-27 have been added. Support for the new claims may be found, at least in the figures, wherein it is clear that the plates disclosed in the figures are shaded for metallic material. Furthermore, paragraph [0057] of the application discloses that the dividing plate 124 is held at ground potential. For the dividing plate to be held at ground potential, it must be made of an electrically conductive material.

New claims 24 - 27 are patentable at least because of the fact that they depend from claim 1. In addition, in view of the fact that the dividing plate is now defined as an electrically conductive material, it clearly distinguishes over the dividing plate of *Suzuki* which is made of a quartz or light transmissive material. This difference is significant because the electrically conductive dividing plate of claims 24 - 27 will prevent the electric field in the plasma generating space from penetrating into the internal spaces of the dividing plate, so as to prevent the decomposition and/or deterioration of the material gas in the internal spaces of the dividing plate.

In paragraphs [0025] and [0054] of the specification, and in claims 5, 6, 7, 8, and 27, the definition of u has been clarified to reflect that u represents the flow velocity, as would be apparent to one of ordinary skill in the art.

Accordingly, in view of the foregoing amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejections. If there are any questions concerning this amendment, the Examiner is respectfully urged to telephone the undersigned so as to expedite prosecution of the application.

Respectfully submitted,

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